Metriorhynchus

Metriorhynchus is an extinct genus of marine crocodyliform that lived in the oceans during the Middle to Late Jurassic. *Metriorhynchus* was named by the German palaeontologist Christian von Meyer in 1830.[1] *Metriorhynchus* was a carnivore that spent much, if not all, its life out at sea. No *Metriorhynchus* eggs or nests have been discovered, so little is known of the reptile's life cycle, unlike other large marine reptiles of the Mesozoic, such as plesiosaurs or ichthyosaurs which are known to have given birth to live young out at sea. Where *Metriorhynchus* mated, whether on land or at sea, is currently unknown. The name *Metriorhynchus* means "Moderate snout", and is derived from the Greek *Metrio-* ("moderate") and *-rhynchos* ("snout").

Metriorhynchus

Temporal range: Callovian - Kimmeridgian, 167–155 Ma

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M. superciliosus, Senckenberg Museum of Frankfurt

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Suborder:	†Thalattosuchia
Family:	†Metriorhynchidae
Subfamily:	†Metriorhynchinae
Genus:	†*Metriorhynchus* von Meyer, 1830 [1]

Species

- *M. geoffroyii* von Meyer, 1832
- *M. superciliosus* de Blainville, 1853

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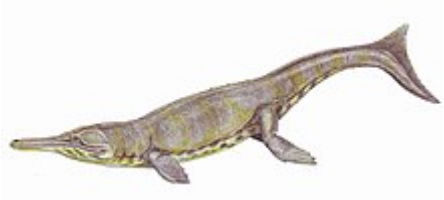
Discovery and species

Fossil specimens referrable to *Metriorhynchus* are known from Middle-Late Jurassic deposits of England, France and Germany.[2]

Valid species

Only two valid species are recognized today, the type species *M. geoffroyi* and *M. superciliosus*. *"Metriorhynchus" hastifer* and *"M." palpebrosus* are generically distinct from the *Metriorhynchus* type species, with *hastifer* being recovered as a geosaurine.[3][4] Species in this genus were traditionally classed into two skull groups: longirostrine (long, narrow jaws) and brevirostrine (short, broad jaws). However, all brevirostrine species have been transferred to the genera *Purranisaurus* and *Suchodus*.[5][6]



Restoration of *M. superciliosus*

Eudes-Deslongchamps (1867–69) recognized four Callovian species of *Metriorhynchus*, *M. superciliosus*, *M. moreli*, *M. blainvillei*, and *M. brachyrhynchus*.[7] Later, Andrews (1913) considered there to be seven valid species: *M. superciliosus*, *M. moreli*, *M. brachyrhynchus*, *M. durobrivensis*, *M. cultridens*, *M. leedsi* and *M. laeve*.[8] However, Adams-Tresman (1987), using linear morphometrics, could only distinguish between the two skull groups, so she found there to be two species from the Oxford Clay, *M. superciliosus* and *M. brachyrhynchus*.[9] Vignaud (1997) however, considered there to be three Callovian species: *M. superciliosus*, *M. brachyrhynchus* and *M. leedsi*.[10]

Unnamed species

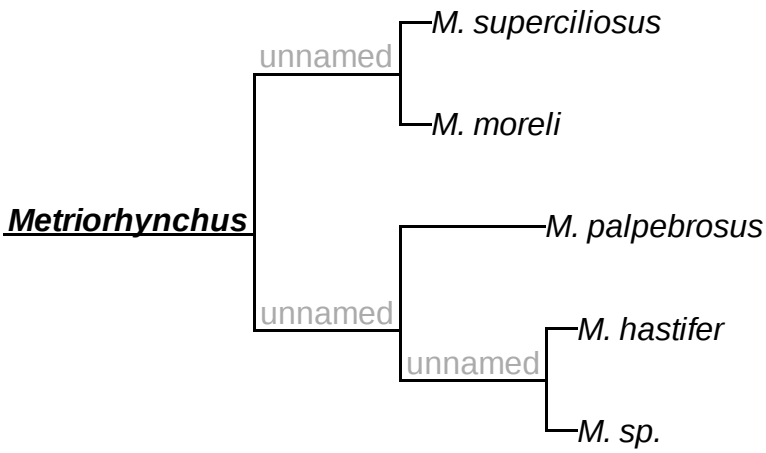
Fragmentary remains attributed to *Metriorhynchus* are known from South America during the Bajocian [11] and Bathonian (both Middle Jurassic).[12] However, phylogenetic analysis has shown that these species cannot be referred to *Metriorhynchus*.[5][13]

Taxonomy and phylogeny

The genera *Purranisaurus* and *Suchodus* have been considered junior synonyms of *Metriorhynchus*,[2] Recent phylogenetic analyses however, do not support the monophyly of *Metriorhynchus*.[14][15][16] Some of the longirostrine forms, however, do appear to form a natural group.[14][16][17]

M. superciliosus at the Muséum national d'Histoire naturelle, Paris

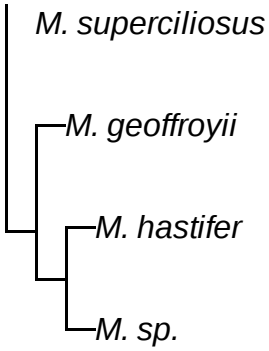
The cladogram presented below follows an analysis by Mark Young and Marco Brandalise de Andrade, published in November 2009.[13]



M. superciliosus and *M. moreli* skulls

Cladogram after Cau & Fanti (2010).[18]

Metriorhynchus



Palaeobiology

Description

Averaging 3 metres (9.8 ft) in length, *Metriorhynchus* was of a similar size to modern crocodiles. However, it had a streamlined body and a finned tail, making it a more efficient swimmer than modern crocodilian species.[19]

Life restoration of a pair of *M. superciliosus*

Salt glands

Metriorynchus had nasal salt glands which, like the salt glands of all other marine reptiles, were used to remove excess salt.[20] This means that like *Geosaurus* it would have been able to "drink" salt-water and eat equally salty prey, such as cephalopods, without dehydrating.[21]

Diet

Metriorhynchus was a versatile and opportunistic predator, predating upon both the armoured ammonites and the fast moving fish; occasionally, it was also capable of capturing flying animals such as the pterosaurs and scavenging on plesiosaur and *Leedsichthys* carcasses on the seafloor.[22]

Palaeoecology

Predators

Even though *Metriorhynchus* was an effective predator, it was vulnerable to predation from apex predators such as *Liopleurodon* which could grow to 6.39 meters (21 feet) in length. Since *Metriorhynchus* had lost its osteoderms, "armour scutes", to become more efficient swimmers it would have had little defense against larger marine predators.

See also

- List of marine reptiles

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Skull of *M. geoffroyii*

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Further reading

- Buffetaut E. 1982. "Radiation évolutive, paléoécologie et biogéographie des Crocodiliens mésosuchienes". *Mémoires Societé Geologique de France* **142**: 1–88

External links

- Metriorhynchus fact files (http://www.bbc.co.uk/science/seamonsters/factfiles/metriorhynchus.shtml)

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